

**Secondary Street Acceptance Requirements  
Implementation Advisory Committee  
September 4, 2007**

**Agenda**

1. Introductions
2. Overview of Senate Bill 1181
3. Review of Concepts and Draft Regulation
4. Lunch
5. Next Steps
6. Adjourn

# VIRGINIA ACTS OF ASSEMBLY -- 2007 SESSION

## CHAPTER 382

*An Act to amend the Code of Virginia by adding a section numbered 33.1-70.3, relating to taking certain streets into the state secondary highway system.*

[S 1181]

Approved March 15, 2007

**Be it enacted by the General Assembly of Virginia:**

**1. That the Code of Virginia is amended by adding a section numbered 33.1-70.3 as follows:**

*§ 33.1-70.3. Requirements for taking new streets into state secondary highway system.*

*A. The local governing body of any county that has not withdrawn from the state secondary highway system or any town within which the Virginia Department of Transportation maintains the streets, may, by resolution, request the Commonwealth Transportation Board to take any new street into the secondary system of state highways for maintenance if such street has been developed and constructed in accordance with the Board's secondary street acceptance requirements. Only those streets constructed in compliance with the secondary street acceptance requirements shall be taken into the state secondary highway system for maintenance. The Board shall promulgate regulations establishing such secondary street acceptance requirements. The secondary street acceptance requirements established pursuant to this section shall include such provisions as the Board deems necessary or appropriate to achieve the safe and efficient operation of the Commonwealth's transportation network.*

*B. In addition to such other provisions deemed necessary or appropriate by the Board, the regulations shall include, but not be limited to (i) requirements to ensure the connectivity of road and pedestrian networks with the existing and future transportation network; (ii) provisions to minimize stormwater runoff and impervious surface area, and (iii) provisions for performance bonding of new secondary streets and associated cost recovery fees.*

*C. No initial regulation establishing secondary street acceptance requirements pursuant to this section shall apply to subdivision plats and subdivision construction plans that have been submitted and accepted for review by the Virginia Department of Transportation on or before the effective date of such initial regulations. No locality shall be obligated to approve any subdivision plat or subdivision construction plans that are inconsistent with these regulations.*

**2. The provisions of the Administrative Process Act (§ 2.2-4000 et seq.) shall not apply to initial regulations promulgated by the Board pursuant to this section, but such exemption shall not apply to subsequent regulations or amendments thereto promulgated by the Board.**

**3. That the Board shall solicit and consider public comment in the development of regulations required by this act.**

**4. Until such time as initial regulations establishing secondary street acceptance requirements are adopted pursuant to this section, the subdivision street requirements and the process and criteria for taking such streets into the state secondary system in effect on January 1, 2007, shall continue to apply.**



# COMMONWEALTH of VIRGINIA

Office of the Governor

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August 21, 2007

Dear Members of the Implementation Advisory Committee for Secondary Street Acceptance Requirements:

Thank you for your willingness to serve as a member of the Implementation Advisory Committee in the development of regulations pursuant to Chapter 382 of the 2007 Acts of Assembly (Senate Bill 1181). For your information, the membership of the Committee is listed below.

Nicholas Donohue	Office of the Secretary of Transportation
Gary Fenchuk	East-West Partners of Virginia
Kathy Ichter	Fairfax County
Art Lipscomb	Virginia Professional Firefighters
Ted McCormack	Virginia Association of Counties
Ned McElwaine	Botetourt County
Eric Nielsen	City of Suffolk
Pat O'Hare	Homebuilders Association of Virginia
Trip Pollard	Southern Environmental Law Center
Harrison Rue	Thomas Jefferson Planning District Commission
Dan Slone	McGuireWoods LLP
Richard Walton	Virginia Department of Transportation
Roger Wiley	Coalition of High Growth Communities

As you may know, a Technical Committee comprised of Virginia Department of Transportation representatives has developed an initial draft regulation that will serve as a starting point for the Implementation Advisory Committee's discussions.

The Implementation Advisory Committee will hold public meetings and the development of the regulations will involve opportunity for public input. The Committee will meet throughout the development of the regulation and will have the ability to refer specific matters to the Technical Committee for additional consideration, if necessary. The Implementation Advisory Committee will work to bring the final regulation to the Commonwealth Transportation Board for adoption.

Implementation Advisory Committee Member  
August 16, 2007  
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The legislation identifies three mandatory provisions of the regulation. The provisions are as follows: "(i) requirements to ensure the connectivity of road and pedestrian networks with the existing and future transportation network; (ii) provisions to minimize stormwater runoff and impervious surface area, and (iii) provisions for performance bonding of new secondary streets and associated cost recovery fees." In addition the regulation shall include all other provisions the Commonwealth Transportation Board deem necessary and appropriate.

The Committee's first meeting is tentatively scheduled for September 4, from 11:00am to 1:00pm, and will be held in Richmond. Additional information, including the meeting agenda and draft regulation, will be forwarded to you in advance of the meeting.

All members of the Implementation Advisory Committee are encouraged to read the enabling legislation as well as the information on the regulation's website (<http://www.vdot.virginia.gov/projects/ssar/>).

Thank you again for your willingness to participate in this important effort.

Sincerely,

A handwritten signature in dark ink that reads "Pierce R. Homer". The signature is written in a cursive, flowing style.

Pierce R. Homer

Copy: Mr. David S. Ekern

## What is a Link-Node Ratio?

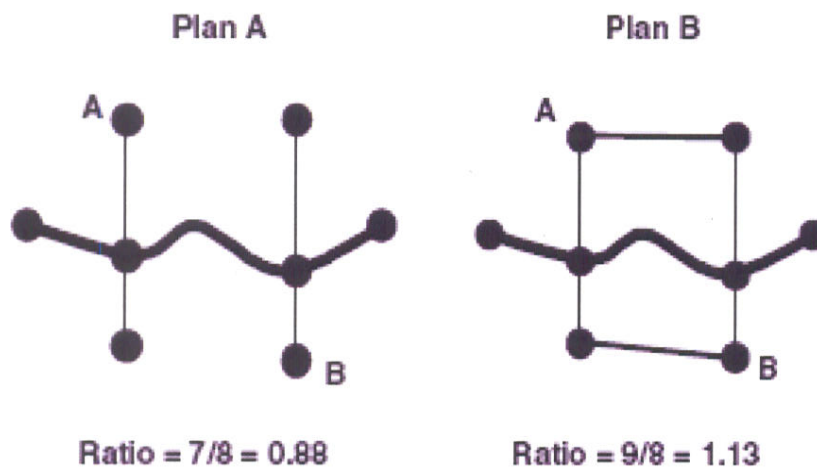
Link-Node Ratio is a methodology for calculating the connectivity of a street network. Link-Node Ratio is the number of links divided by the number of nodes within a development or area.

Links are defined as roadway or alley segments between two nodes.

Nodes are intersections or ends of cul-de-sacs.

A perfect grid has a ratio of 2.5.

The figure below demonstrates how a higher link-node ratio has increased connectivity. Both plans have the same number of nodes. Plan B has two additional links, resulting in a link-node ratio of 1.13 versus 0.88 for Plan A. Under Plan A there is only one route between points A and B. Under Plan B there are three potential routes. This represents increased connectivity.



Link-Node Ratios does not reflect the length of the links. A perfect grid of 2,000-foot blocks will have the same link-node ratio as a grid with 350-foot blocks. Link-node Ratios may be combined with intersection spacing and average block length standards to address this issue.



1. enforce the Income and Eligibility Standards and Deed Restrictions contained herein, or
2. contract with the Sarasota County Housing and Community Development Department or with a private non-profit or for-profit administrator of affordable housing to enforce the Income and Eligibility Standards and Deed Restrictions contained herein.

#### **4. Special Topic Discussion: Regulating Street Connectivity**

Street connectivity is a common goal of local governments for many new communities, especially those developed under New Urbanist principles. Local governments seeking to ensure street connectivity in new communities incorporate regulations for connectivity into the local zoning ordinance and land development regulations.

There are a variety of methods that incorporate connectivity into local regulations. Due to the relationship between streets and blocks, local governments can regulate either to achieve street connectivity. Following an exploration of the reasons many communities seek street connectivity in their new communities, five methods for regulating connectivity are described. Most of these methods are not mutually exclusive, and many local governments layer several connectivity regulations.

##### **Purpose and Intent of Promoting Connectivity**

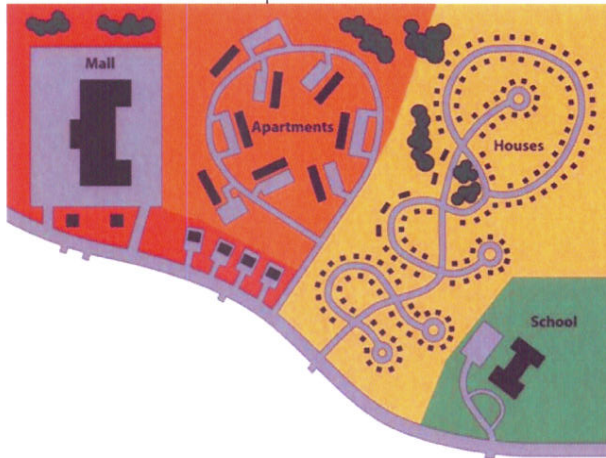
Connected street systems provide for more livable communities as well as reduced costs to local governments. By offering more choices for mobility through a finer network of streets, traffic is more evenly dispersed on the street network and livability on a neighborhood's primary streets increases. Common sense suggests that a connected street network reduces how far a resident has to drive. A 1992 City of Raleigh study confirmed common sense. Using a transportation modeling program, the City performed a comparison of an interconnected neighborhood street pattern with a neighborhood street pattern that relied heavily on culs-de-sac. The results of the comparison revealed the following benefits:

- Vehicles traveling on the interconnected street network traveled an average of 16% less miles per day than the vehicles on the cul-de-sac street pattern;
- The main streets comprising the interconnected street network averaged less than ½ the traffic volumes that the main streets carried on the cul-de-sac street pattern.

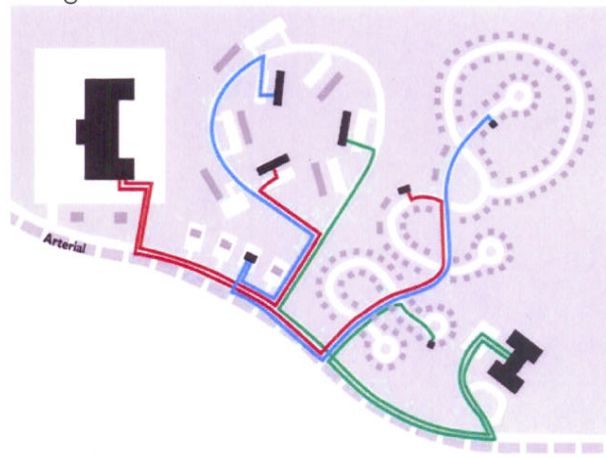
More important to the increase in livability is the opportunity to access different areas of the community without forcing every resident out onto the arterial. A neighborhood's younger and older residents avoid the large arterials, so street connectivity allows greater accessibility for more residents. Figure 1 demonstrates the increase in accessibility choices inherent in a connected street network.

Figure 1: Street Connectivity and Traffic Patterns

Conventional Development



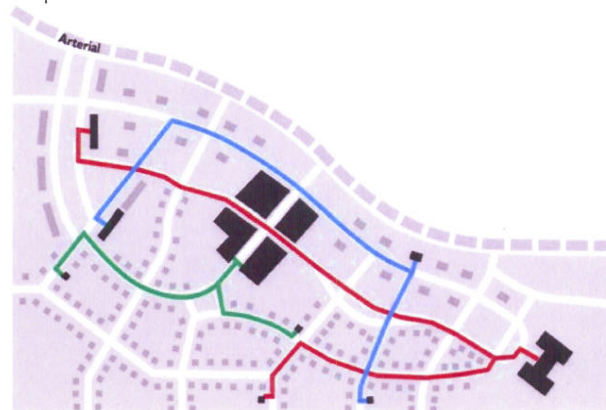
Congested Traffic Pattern



Traditional Development



Dispersed Traffic Pattern



Source: Development Pattern: Andres Duany and Elizabeth Plater-Zyberk; Traffic Allocation: Glatting Jackson.

The provision of public services like water, refuse collection, and emergency services is more efficient when street networks are interconnected. Looped and interconnected water distribution provides for even water pressure and higher quality water. Refuse collection on culs-de-sac requires workers to stop at the end of the street and drive back out to the primary street. This inefficient practice is called "dead-heading," and gas, time, and vehicle wear-and-tear happen while no resident's refuse is picked up. Police and fire responders can more quickly reach a home within a connected street network, especially when street sections are blocked, for instance, due to a storm.

In summary, connectivity regulations are intended to achieve:

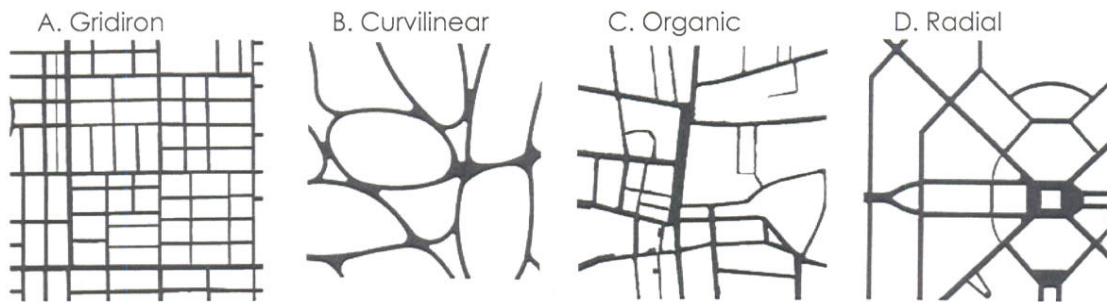
- decreased costs associated with solid waste collection for residential subdivisions;
- improved the water distribution system (water quality) within residential developments;
- improved response time for emergency vehicles;
- reduced congestion on major streets due to a lack of alternative connecting routes or alternative modes of transportation; and



- established network continuity for alternate travel modes as defined by no gaps in the street network.

While the traditional grid is the most common pattern of highly connected street networks, other types of street patterns are capable of providing connections. Some examples are diagrammed in Figure 2.

Figure 2: Street Network Design Patterns



Source: Glatting Jackson

*The City Council hereby finds and determines that an interconnected street system is necessary in order to protect the public health, safety and welfare in order to ensure that streets will function in an interdependent manner, to provide adequate access for emergency and service vehicles, to enhance nonvehicular travel such as pedestrians and bicycles, and to provide continuous and comprehensible traffic routes. [For reference, see Institute for Transportation Engineers, ITE Transportation Planning Council Committee 5P-8, Traditional Neighborhood Development Street Design Guidelines (June 1997)].*  
(Concord, NC, Street Connectivity Requirements)

### Limiting Culs-de-Sac

The first method for regulating connectivity, prohibiting culs-de-sac or limiting their number, is perhaps the most common. A cul-de-sac is the most obvious example of unconnected streets, and their proliferation in suburban-style development has been rampant. A prohibition on culs-de-sac is difficult to enforce since culs-de-sac are occasionally necessary to accommodate water bodies, other environmental features, and development edges. Most communities do regulate the length of culs-de-sac grounded in concerns for emergency service provision. Some fire chiefs require additional hydrants and even residential sprinklers on excessively long culs-de-sac. The Uniform Fire Code requires smaller spacing of fire hydrants on dead-end ends than on comparable connected streets (1997 Uniform Fire Code, Appendix III-B).

Pro: A limitation on the presence or length of culs-de-sac is easy for the developer to understand and for the local government staff to regulate.







**115 Link**  
**48 Nodes**  
 $115 / 48 = 2.396$



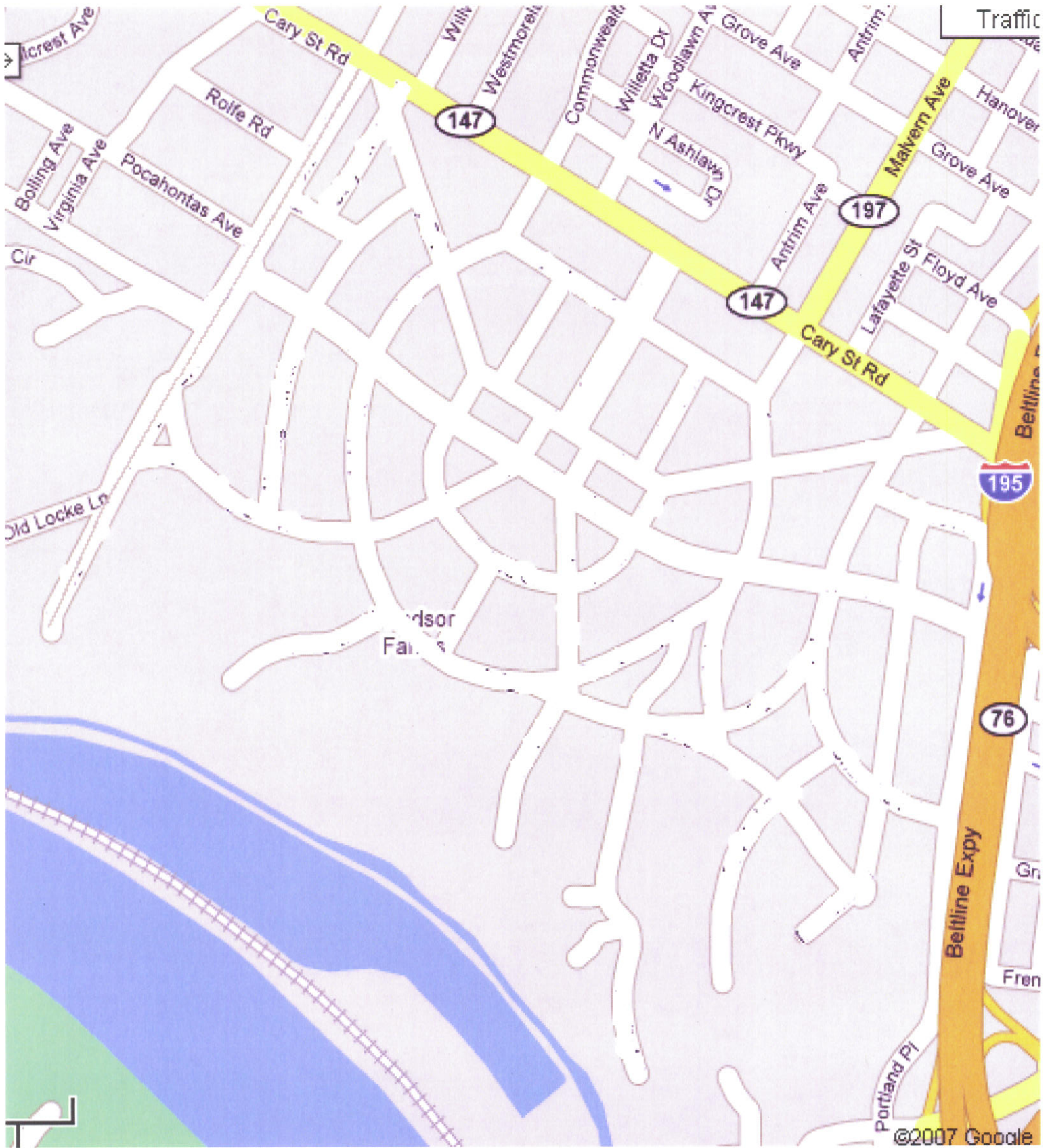




**151 Links**  
**69 Nodes**

$$151 / 69 = 2.188$$





Traffic

147

197

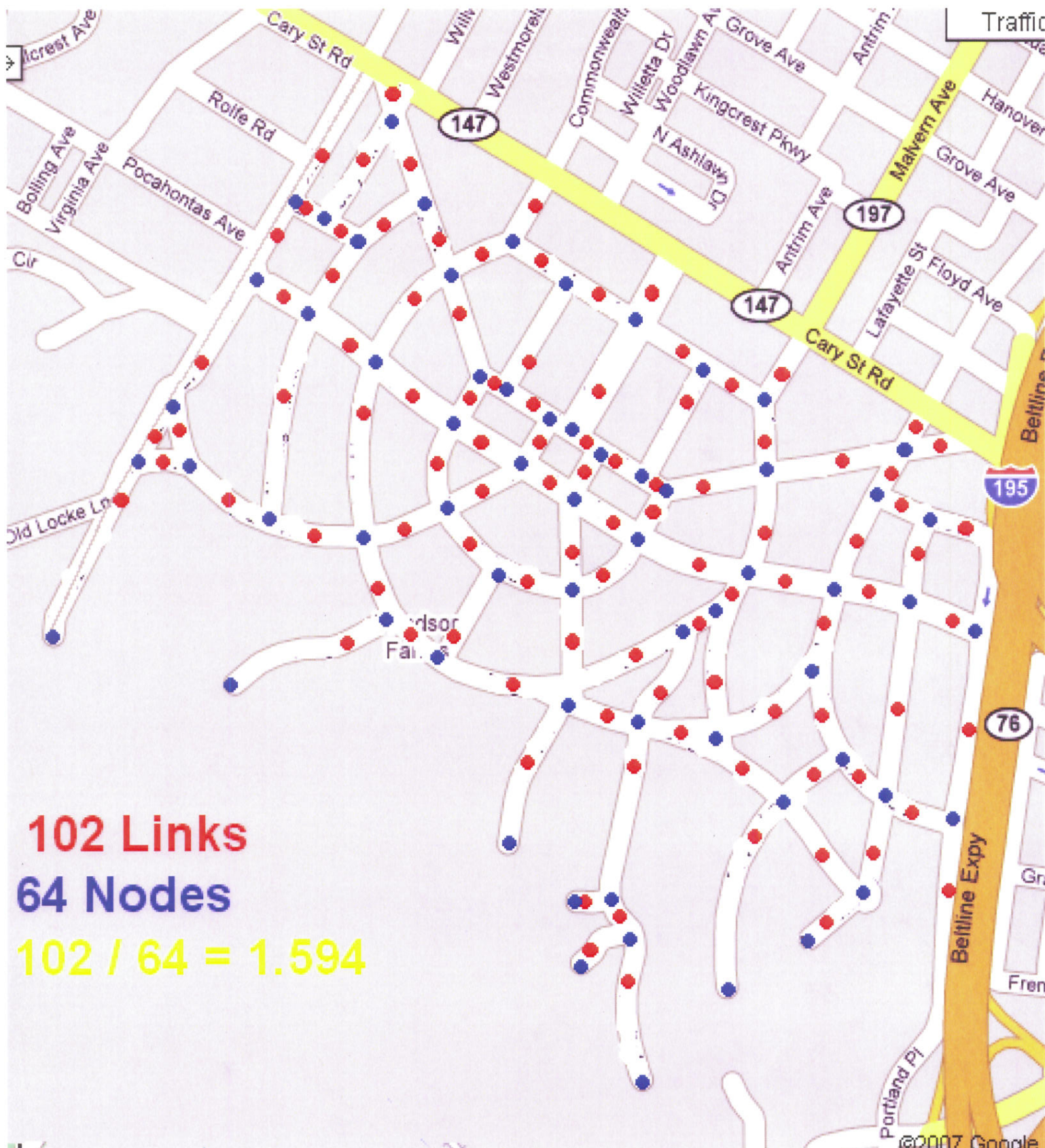
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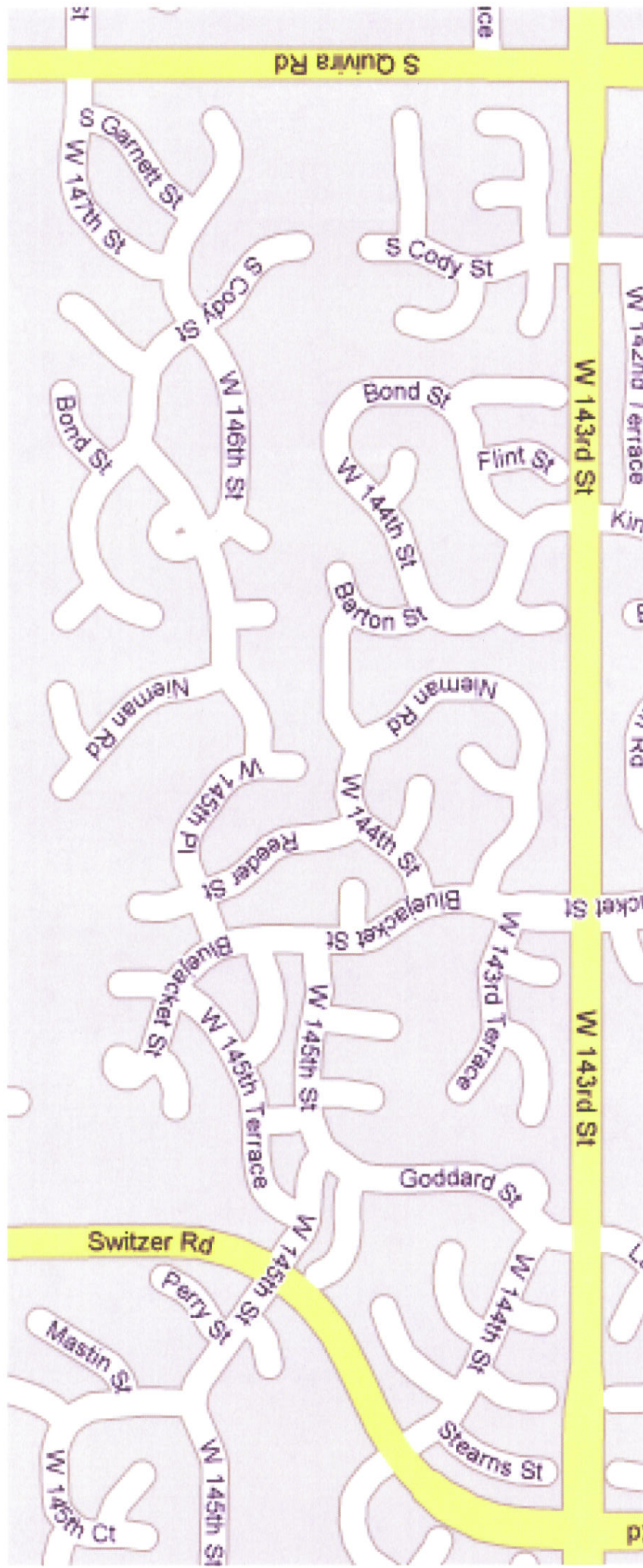
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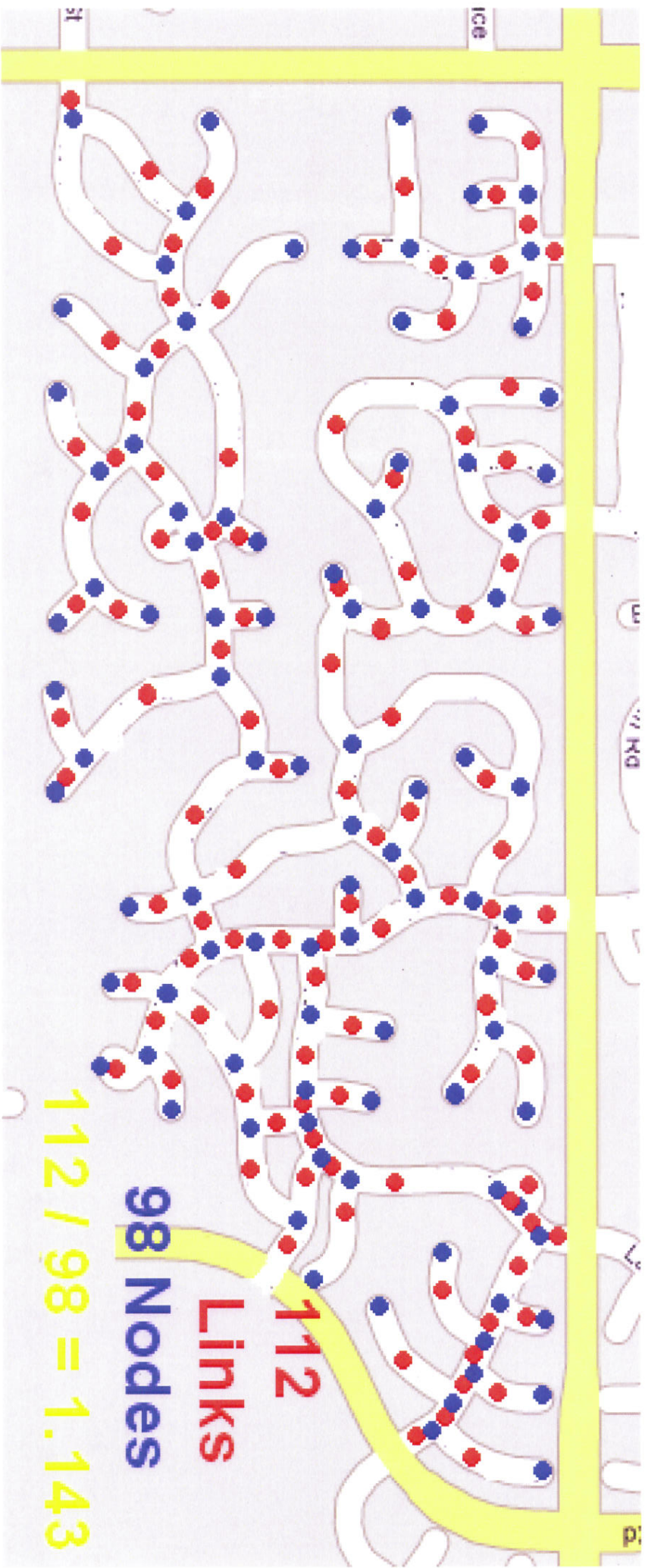












112

Links

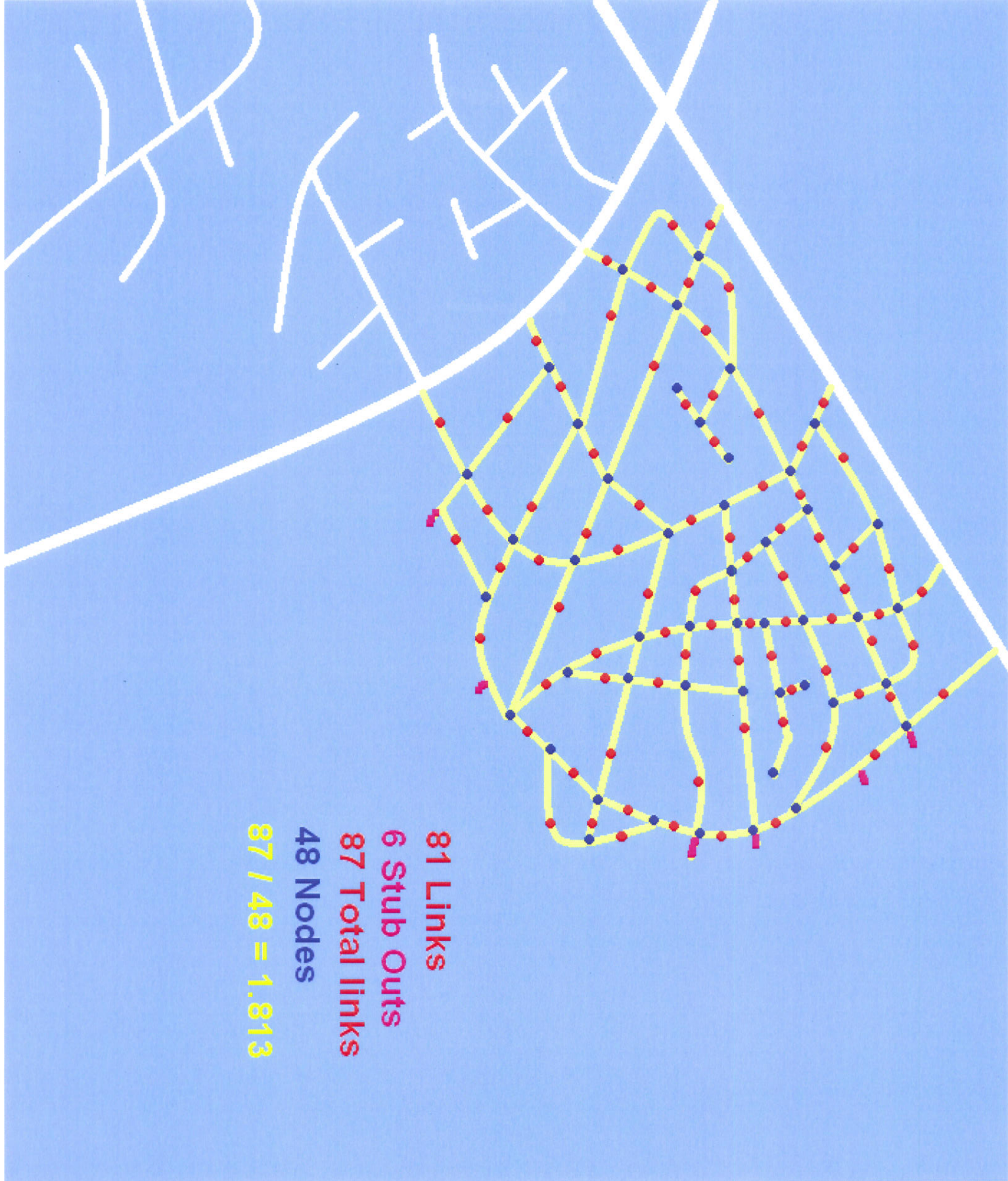
98 Nodes

$$112 / 98 = 1.143$$



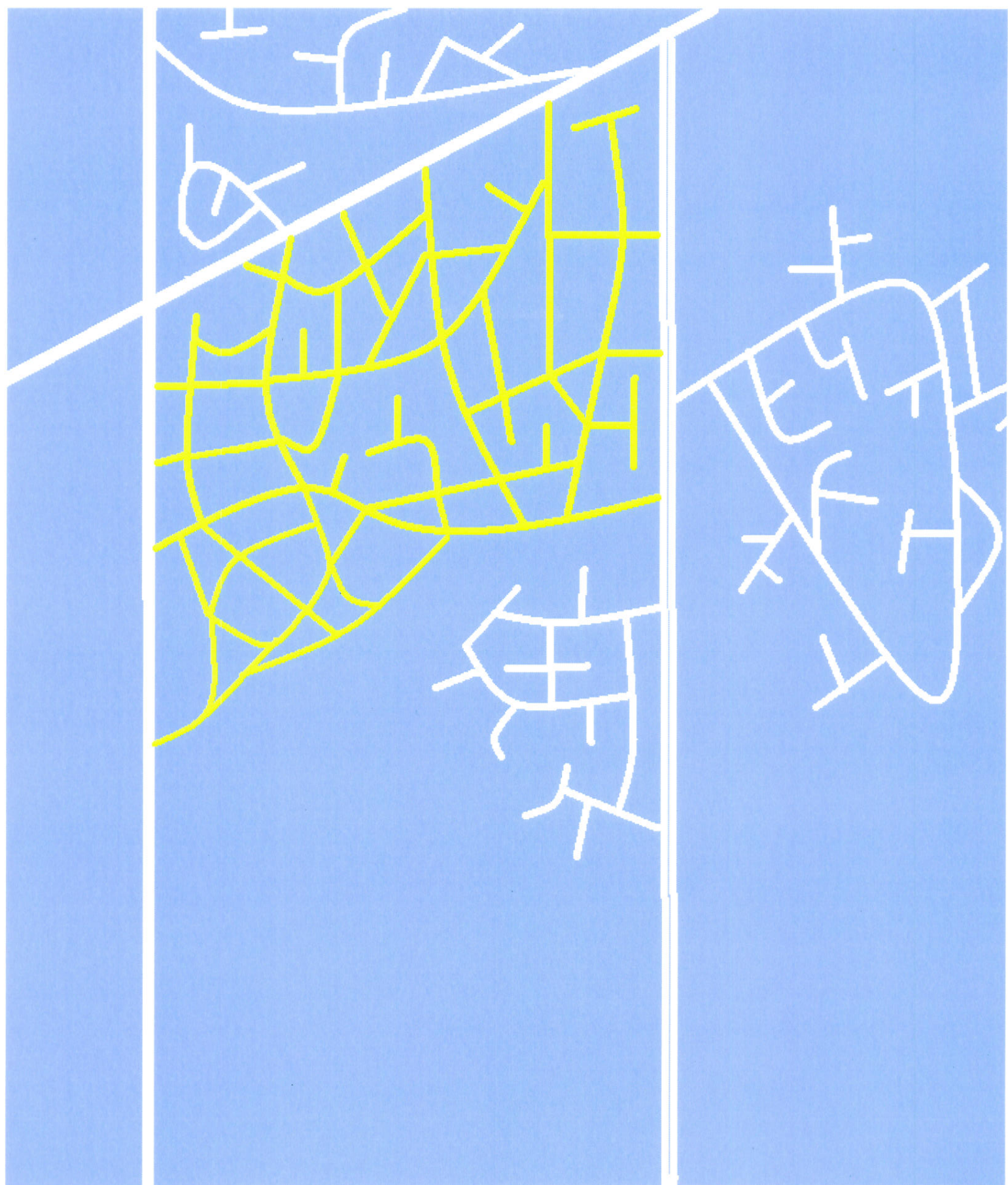




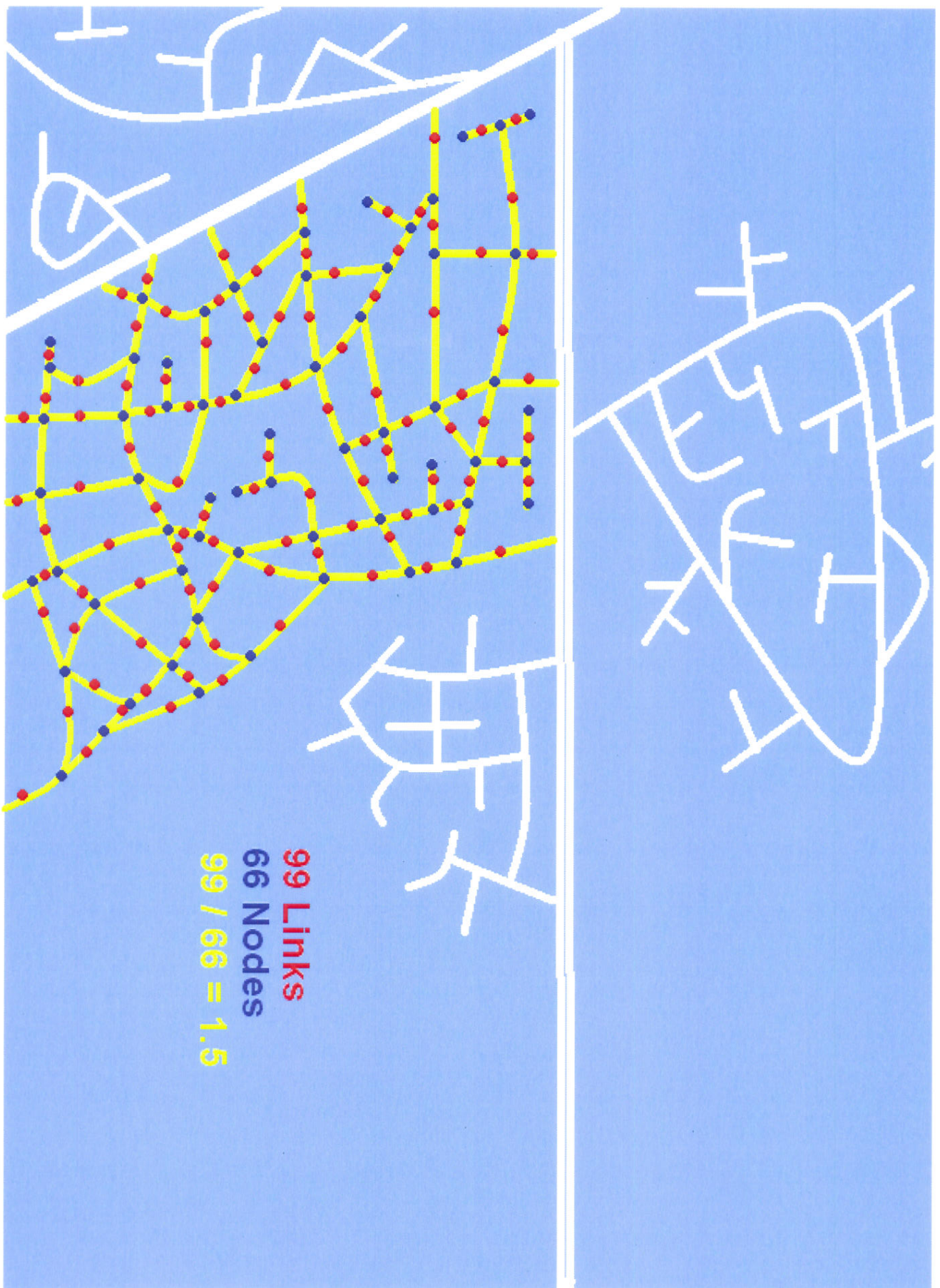


81 Links  
6 Stub Outs  
87 Total links  
48 Nodes  
 $87 / 48 = 1.813$









99 Links

66 Nodes

99 / 66 = 1.5